

BITTER AND ROPY MILK

The Source and Nature of the Bacteria Which Make These Conditions Possible.

BY I. A. ROGERS, United States Bureau of Animal Industry.

This distinct bitter taste which sometimes appears in milk may be caused by (1) certain weeds that the cow has eaten, (2) an abnormal condition of the udder, (3) an advanced period of lactation, or (4) the action of certain bacteria. Only the fourth cause of bitter milk will be discussed in this paper.

It is probable that the bacteria causing bitterness are not at all uncommon and that they could be found in many lots of milk showing no bitterness. Some of these bacteria form acid and sour the milk; the more common forms, however, form little acid and are checked by the growth of the lactic acid bacteria.

Nearly all of them form spores and thus survive heating, which destroys the lactic acid bacteria. For this reason bitterness has been most frequently observed in pasteurized and imperfectly sterilized milk.

The few remaining spores germinate, and as they are unhindered by the presence of lactic acid bacteria they soon reach unusual number and the bitter flavor appears.

Bitter milk may appear as an epidemic, persisting day after day, and causing great trouble. This may be due to some constant localized source of infection which adds each day unusual numbers of bacteria to the milk. In some cases it has been found that the udder of a cow was infected. This should be determined by carefully cleaning the udders of all cows and milking from each quarter of the udder of each cow into fruit jars or bottles which have previously been cleaned with boiling water.

In case one of these samples shows a well-developed bitterness while others remain normal, it may be assumed that the source of infection is the udder of the cow. In that case there should be injected into the udder after each milking a solution of one part of hypophosphite of soda in 100 parts of water.

It is possible in many cases that the source of infection is not localized. If through some combination of circumstances the lactic acid bacteria are suppressed, other kinds become predominant.

The utensils, the milk room and the stable gradually become inoculated with these bacteria or their spores and each new lot of milk is thoroughly inoculated.

The bitter-milk bacteria may be one of the new forms. In this event it may be necessary, after thoroughly cleaning everything coming in contact with the milk, to introduce some good sour milk from a neighboring dairy.

In this way the normal fermentation may be restored and the objectionable bacteria suppressed.

Ropy milk is, so far as known, in no way detrimental to health. The famous Edam cheese is nearly all made from milk which has undergone this fermentation.

Most people, however, object seriously to milk with any tendency to form threads. This trouble frequently affects the milk of a dairy day after day and is removed only by the most drastic measures.

Outbreaks of this nature frequently occur in the cold months, because the bacteria of this group thrive better at low temperatures than the lactic acid bacteria which hold them in check under normal conditions.

In one case it was found that these bacteria were abundant in the dust of the stable. The trouble was removed by thoroughly cleaning and whitewashing.

In another serious and persistent outbreak it was found that the milk as it came from the dairy contained few or no rropy milk bacteria, but they were abundant in the water tank in which the milk was held overnight.

The small amount of water occasionally splashed into the cans added sufficient bacteria to make the milk ropy in a comparatively short time.

The utensils and floor had become so thoroughly impregnated with this organism that milk exposed in the room or strained through the wire strainer became ropy without contamination with the water.

The trouble was removed by thoroughly scalding all the utensils, disinfecting the floor with a 5 per cent sulphuric acid solution and destroying the organisms in the ice water by adding potassium bichromate—in the proportion of one part to 1,000 parts of water.

FACTS WORTH KNOWING

The first English bushel measure was fixed at eight gallons of wheat during the reign of Henry VIII. The bushel now legal was regulated by parliament in 1824 and is the same in the United States.

Butter is never used by the Greeks, Romans or Chinese, being preferred in Africa, at Kebsa, vegetable butter made from the fruit of the shea tree and is said to be of richer taste than any butter made from cows' milk.

When mourning for their dead the Israelites neither washed nor anointed themselves. Greeks and Romans fasted. In Europe they wear black, in China white, in Turkey violet and in Ethiopia brown.

Washington's monument in Washington, D. C., is the highest structure of kind in the world except the Eiffel tower in Paris. It cost \$1,200,000. It is a white obelisk 555 feet in height. The base is 66 feet square and the walls are 15 feet thick. It is built of crystal Maryland marble, lighted by electricity and has a stairway of 800 steps and also an elevator which rises in seven minutes.

Cattle were first brought to America by Columbus on his second voyage. Tobacco was introduced into England by Sir Walter Raleigh in 1585. Potatoes were also carried to England by Raleigh.

Wedding rings were first used by the ancients and put upon the third finger of the left hand, from a supposed connection of a vein there with the heart. They were first made of iron. Wedding rings in England are of standard gold by statute, 1865.

Spraying the cows will discourage the flies and keep up the milk supply. Too much trouble? Well, trouble of this kind usually pays big.

JUNE WORKING NOTES

Notice little white spots on the pear leaves? This is leaf blight. Bordeaux sprayed about three weeks after the blossoms fall and twice more at intervals of about two weeks will prevent it.

The leaf-eating insects are busy in the orchard now. Give them paris green.

The June heat is the most enervating of the season. Go slow with the horses and take it easy yourself till hardened to the work.

Now the sprouts on the trees are sprouting vigorously. Better rub them off now than cut them later.

When you plant canteloupes sow a big of radish or turnip seed in the hill. These will come up first and keep the bugs busy till the vines get a start.

Don't neglect to plant sweet corn at least three times—six is better.

Now is a good time to give the poultry houses a thorough cleaning—not a partial one—white wash. Mites thrive in hot weather.

Remember that flies breed in filth and dust and carry more disease than rats. Clean up every breeding place and screen them out of the house and dairy.

It is a mistake to let bee hives stand in the hot sun. Place them under a sheltering tree or vine with a good circulation of air.

If you do not have a hive ready the bees will surprise you by swarming when you are the busiest and you may lose them.

Milk is plentiful now and the hens ought to have their full share of it. If you have no range for the poultry you must give them green stuff all summer. Sharp grit, too—not sand.

Better burn all the old berry crates. Fruit in nice, clean boxes will bring a price enough better to pay for the loss of the old crates.

If the cabbage root maggot is at work fit a piece of tarred paper close about the base of the plants. It will help.

Watch the climbing roses with sulphur early in the morning, while the dew is on, to prevent mildew.

If you grow late maturing crops in the peach orchard they will keep the wood growing too late to make them safe for winter. Clean up the ground this month.

BEES ARE INTERESTING

The most important product obtained from bees is the honey. This is scarcely different from the nectar secreted by flowers, the honey from different plants being so little changed by the process of storage and curing in the hive that the honey from each kind of plant retains its particular color and flavor. In collecting and storing it the bees simply pump it into the honey sack and from this it is forced back through the proboscis and deposited in the cells of comb in the hive.

Wax is a product of the bees, and is produced from plant and is used in the formation of comb. The architecture of the bee is therefore dependent upon a particular kind of material produced by the bee itself, and is distinctly different from the structures built by ants or wasps, which use earth or wood or some material ready at hand for their processes of building.

In another way bees are very important to the human species, because many plants—such as the apple tree, clover, etc.—are dependent upon them for pollination, and without their assistance the crops might be much reduced.—Herbert Osborn, Professor of Zoology, Ohio State University.

But it isn't the New England idea of thrift to do something like nothing, nor is Massachusetts going into the forestry business for her health. Her officials estimate good profits from the industry—not as big perhaps as they get from hogs and alfalfa out west, but still good, comforting profits.

They deal figures out something like this: An acre of good timber at forty years is worth \$300. The state has nearly 3,000,000 acres of forests and waste land, leaving out the parks, and it is figured that if these 3,000,000 acres forty years from now are covered with nice trees they will be worth something around \$900,000,000.

Of course much of the timber will have some tangible value after five years' growth from the seedling, but the big results will come after pretty much all the timber in adjoining states has been cut off.

At any rate the people of Massachusetts are beginning to sit up and notice—as they always do at any sound like a dollar—and the reforestation scheme seems to be pretty firmly grounded.

Save the earliest and best pullets for winter layers. If one or two are not so thrifty as the rest, get rid of them. Keep your chicks tame. It is a nuisance to have to use a shotgun to catch a chicken. Incubator chicks are as tame as chickens. They are accustomed to being handled and are never rendered unmanageable through fright. Chicks, as surely as people, are creatures of habit. Feed always in the same place and as nearly as possible the same time, and they will rarely fail to come at the call.

Count your flocks as you feed. A missing one may be found and rescued from some trouble if it is looked for at once.

If there is a meadow adjoining the poultry yard do not worry if the chicks stray into it. They will thrive on the bugs and grasshoppers, and are so completely overhauled by grass that the hawks make small ravages. But be sure that they are shut up when the grass is wet or the mowing machine about to be used.

Strips of cloth tied on the branches of trees near the poultry yard will do much at frightening away hawks.

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STOCK EAT PRICKLY PEARS

Results of Experiments Made at New Mexico Experiment Station Show This.

BY PROFESSOR B. F. HARE, New Mexico Experiment Station.

The increased use of the prickly pear (the flat-jointed members of the genus *Opuntia*) as feed for all classes of ruminants, especially for range and dairy cattle, makes it important for the proper preparation of a ration that the feeder know how much digestible nutrients to expect from feeding a given quantity of the plant either alone or mixed with other feeding stuffs.

Experiments seem to show that when prickly pear is fed with cured fodders or grains, the digestibility of both is increased.

The nutritive ratio is very wide for this feed, and in feeding it to all classes of animals, for whatever purpose, much better results should be obtained when it is fed with some substance of high protein content.

The steers experimented upon seldom drank water when fed prickly pear alone. In fact, in feeding a ration of 100 pounds of this feed per day, the water obtained from the feed over eight gallons of water, which is more than was usually drunk by them when fed cured fodders alone.

While no digestion experiments were made with any of the cacti other than prickly pear, the digestion coefficients of the latter could probably be safely used for all other members of this family, since their composition and other characteristics are similar.

Animals scour quite badly when fed prickly pear alone; besides, other feeds are needed to supply the proper amount of protein, for these reasons it is better not to feed it alone.

A ration for a 1000-pound milk cow of fifty pounds of prickly pear, ten pounds of wheat bran and ten pounds of alfalfa would furnish about the correct theoretical amount of nutrients, in which the ratio of proteins to carbohydrates would be 1 to 5.45.

Each spring and fall wash down the trunk and larger limbs of the tree with a solution of soft soap and water, about half and half. This will destroy insects and keep the bark smooth and healthy.

Keep down all suckers from around the trunk and remove all sprouts from the trunk. The pear, however, needs little pruning if the trees make a strong and vigorous growth for several years, unless there is a tendency to grow too much in height at the expense of the width.

Low heads are more desirable. However, when pruning is necessary, it should be done to conform to the habits and natural shape of the tree.—R. B. Rushing.

Among the promising forms of farmers' organizations is insurance. There is no reason why life and fire insurance should not be conducted with tremendous benefit and profit to shareholders. It is work for the National Grange.

The community that will not maintain good roads does not deserve the benefits of rural route postal delivery. If a railroad train kills a man or his horse or cows the company has to pay the damages. Owners of automobiles should be held equally liable.

James J. Hill continues to preach soil fertility wherever he goes. It is good gospel and cannot be too widely spread.

Young man, better a successful farmer than an unsuccessful clerk in a city store.

Here is something for every farm boy to consider: It is a fact that only one out of every 300 farm boys who go to the cities rises above the drudgery of clerkship with its poor pay and downright slavery.

SPRAYING APPLE TREES

About the only use most of us make of our sprayers is to kill potato bugs and chicken lice. At one time the writer was of the opinion that the spraying of trees was too much trouble. I have twenty-five apple trees, many of which are old. In the nine years I have lived on the place I have had very few apples that were not wormy.

A large percent always dropped off and rotted. Last year I sprayed the trees when they were in full blossom, using Bordeaux and London purple. It took me about two hours. I sprayed them inside and out and was surprised at the results. The leaves stayed green until late in the fall. A very small percentage of the apples dropped and I found only two that were wormy.

Cull out the young roosters for broilers as soon as they are ready. They will never sell for so much again, and will but consume food that could better be used on another brood of chicks.—Bessie L. Putnam.

SOME POULTRY YARD HELPS

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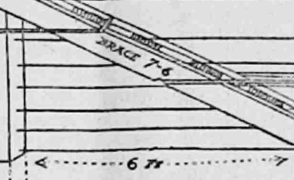
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THE BRACE THAT HOLDS

BY J. W. GRIFFIN, WARSAW, KY.

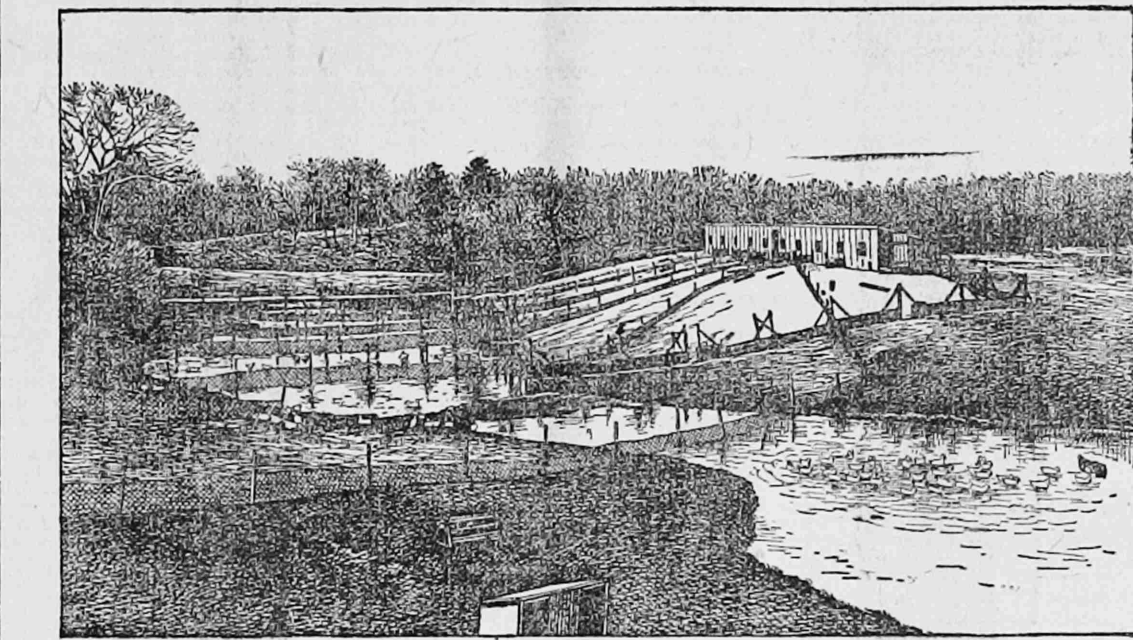
Material for the brace, if sawed stuff, should be 2 by 6 inches; if poles are used they should be heavy enough to fill the notches in corner and brace posts.

First cut notches for the brace in the posts, then set corner or end post good and deep; tamp well. Next set brace post six feet from end post. Cut the braces, two of them; fasten a piece of inch board between at each end temporarily; nail the braces lightly to hold solid while wiring them to the posts. Take some of the fence wire and wrap several times, as shown in the cut. After the fence is up put an inch block between each two wires between the braces.



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A SPLENDIDLY ARRANGED BREEDING HOUSE FOR DUCKS



The above shows a duck house with wire-separated water runs. This is an admirable plan for farmers who have running water on their farms.

THE PEAR ORCHARD

The first three or four years after setting it is best to cultivate the pear orchard in vegetables of some sort, but never in wheat or rye. The vegetable crops require both manure and cultivation, which benefit the young pear trees.

When the pear tree makes a fine growth the year, however, needs little pruning if the trees make a strong and vigorous growth for several years, unless there is a tendency to grow too much in height at the expense of the width.

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NEW USE FOR CORNSTALKS

Government's Experiments for Making Paper Out of These Likely to Be Valuable.

Professor B. T. Galloway of the Agricultural Department at Washington, who has been experimenting with cornstalks as a material for making paper, announces that great progress has been achieved along this line. While he does not say that the experiments so far prove that the thing is actually accomplished and is a commercial success, he is very hopeful that it will work out satisfactorily.

The paper workers are greatly interested in the experiments because, if it turns out that this great product of the farm can be turned into good paper it will have a marked effect on the paper-making industry.

Cornstalks are about the cheapest product grown on the farm and while not entirely useless as stock food, millions of acres are allowed to go entirely to waste every year.

Paper-making work is becoming somewhat scarce, although there is no such famine in the northern woods as

EDITORIAL DICTUM

Many claim that travel is apt to make a man discontented, but with me travel breeds contentment. A trip among fellow farmers in other sections shows me how I may improve my own methods. The more I travel among successful farmers the more thoroughly I am convinced that it is more in the man than in the farm or location. I have seen men on eastern farms that were naturally thin soil who were making good money on their investments, while on the other hand I have seen men who were losing money every year on some of the most fertile farms of the west. It is the man more than the location.

Ever know a man to scrub his hogs unless he was intending to take them to a state fair? Well, I have. I have a friend in central Ohio who keeps his hogs as clean as his Jersey cows. He declares if two lots of hogs are treated alike in every respect, except that one lot receives a thorough scrubbing with soap suds once in a while, there will be a marked difference in favor of the hogs that are washed when the time for slaughtering comes. A clean bed of straw, with a dry house, so as to afford them comfort at night, will also promote thrift and growth. There may be something in that argument.

Corn is a hog cannot be too clean if he tried. I do know that naturally a hog is a pretty clean sort of animal and he enjoys a bath as much as a man does. If the hog is considered a filthy animal that devours filthy food it is because of the treatment given. Hogs will select clean and wholesome food always if given the opportunity to do so.

The time is not far distant when people will place a higher estimate upon the value of skim milk as a human food. Many of our scientific men have devoted much study and attention to this phase of the dairy business until they have solved the problem of preserving this liquid food in a solid form, and already there are a number of powdered milk plants in operation and the demand for the product is rapidly increasing.

There is no forage crop, excepting alfalfa, that possesses as many valuable qualities as our common red clover. All ruminants prefer it to other hay.

Clover thrives on almost all forms of soil and it is especially valuable on sandy soil, as it draws its nourishment from the subsoil and from the atmosphere and brings back to the surface many soluble elements of fertility that have been washed down through the soil by leaching.

Alfalfa ought to grow well on this Kansas farm and simply because some other farmers have not succeeded with it is no reason why our young friend should not try it. Sow on high or rolling land, well drained, in a perfect seed bed, thirty pounds to the acre, and it ought and doubtless will do well. It is successfully grown in nearly all of the eastern states, but is particularly well adapted to western soils.

GOOD MONEY IN BEANS

There is good profit in white field beans, and they are a pretty sure crop. If the soil is too rich the vines will grow rank, or if the soil is loose and gravelly there will be difficulty in retaining sufficient moisture. A good loam corn land is the right soil. I use beans in a four-year rotation—two years clover, one year corn, followed by beans.

Plow after corn planting is done and make a good, fine seed bed. Planting occurs May 15 to July 1—perhaps the most being planted in the first half of June. Use from one-half to three-fourths of a bushel per acre. I drill in rows 23 inches apart.

Up to the time of blossoming the cultivation of beans is practically the same as for corn. It must be frequent to destroy the weeds and preserve the soil much, thereby conserving the moisture of the lower soil. The beans roots are so far developed at the time of blossoming that further cultivation will hurt rather than help the crop. It is a good plan to plant a part of the crop early and a part late, as cultivation and harvesting are better distributed and the leaves of one crop may help the other. This is a valuable feature.

Fertilizing is an important matter in raising beans. If the soil is too poor it will not raise good beans and it will not do to apply barnyard manure directly to the crop. It pays better to apply manure a year in advance, and if the farmer will give this crop proper attention he will find it will give him as great returns for money and time invested as anything he can raise.—E. L. Griffin, Michigan.